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**REMARKS**

1. Claim 16 has been amended to more clearly point out and distinctly claim the invention. Support for the amendment is found at P.3, lines 11-20 and P. 4, lines 22-24. As no new matter has been introduced by the amendment, it is respectfully submitted it should be admitted.

2. Claim 21 has been cancelled without prejudice.

3. New claims 22, 23 and 24 have been submitted to claim all that to which the inventor is entitled. Support for claim 22 is found in Example 3. Support for claim 23 is found at P. 3, lines 16-18. Support for claim 24 is found <sup>page 8 lines 20-22</sup> 22, and at P.5, line 31 to P.6, line 2. Support for claim 24 is found at P.3, lines 24-26. As no new matter has been introduced, it is respectfully submitted that these claims should be admitted.

4. Claims 16, 18 and 21 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Queen et al (US 5,567,256) in view of Stahlecker et al. (US 4,495,758) and GB 2,205,116 A. Queen et al. is relied upon as disclosing a process of making blended yarns containing heat-activated adhesive and base fibers for carpets. Stahlecker et al. is relied upon as disclosing a blended binder/base yarn using a wrap spinning method. GB 2,205,116 is relied upon as disclosing wrap spinning and heat activation of a blend of binder fibers containing heat-activated adhesive and base fibers to stabilize a blended carpet yarn.

Claim 16 has been amended herein and claim 21 has been cancelled without prejudice.

The invention as presently claimed is a process for producing tufting yarns by ring spinning or wrap spinning a base fiber bundle that does not contain heat activated adhesive material with a second fiber comprising a heat activated binder material. The ring spinning or wrap spinning places the heat-activated binder fibers uniformly and continuously around the base fibers during twist insertion or wrapping to form the spun yarn. This yarn is then heated to melt the binder fiber, and upon subsequent cooling, encapsulates and binds the base fiber bundle.

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The present process differs from Queen et al. (US 5,567,256) in several respects. First, the process of the invention produces a singles yarn suitable for tufting. The yarn produced by the inventive process need not be ply twisted prior to tufting into a backing material to form a carpet. This is a significant advantage over the prior art.

Second, as Examiner has noted, Queen et al. does not disclose ring spinning or wrap spinning of its yarns. Moreover, in Queen et al. each of the yarns to be plied to form the final carpet yarn consists of a single yarn component, i.e., a blend of base fibers and low melting material. "Blending" means that the low melting material is randomly dispersed in the base fibers. In the present invention, the ring spun or wrap spun yarns have two distinct yarn components – a first fiber bundle consisting essentially of base fibers and a second fiber which comprises heat activated binder fibers. While the second fiber may comprise a blend, the first fiber bundle and the second fiber are not blended with one another but maintain their separate identities in the ring spun or wrap spun yarn.

Stahlecker et al. (US 4,495,758) describes a process for producing wrap spun yarn. Stahlecker et al. provides no disclosure or suggestion that the wrapper yarn may contain a heat activated binder fiber. Indeed, Stahlecker et al. does not provide any suggestion that the core yarn and the wrapper yarn may differ in any respect.

GB 2,205,116 A discloses a carpet yarn having only one yarn component consisting of a blend of a base fiber (wool) and a heat activated bonding agent as can be seen from P. 6, lines 3-6, as follows: "In use with a bonding agent consisting of bonding fibres, the dispersion of the bonding fibres among the non-adhesive fibres can be achieved by conventional textile blending techniques." (emphasis added) This is followed in GB 2,205,116 A at P.6, lines 6-11, by a distinction between "blending" and techniques of processing the blend to yarn form including wrap spinning. There is no suggestion that the core yarn and the wrapper yarn may or should have different compositions. As with the disclosure of Queen et al., GB 2,205,116 fails to teach a method of forming a yarn containing two distinct yarn components. Also as with the disclosure of Queen et al., GB 2,205,116 fails to teach a method of producing a singles yarn suitable for tufting without ply twisting.

To further illustrate the differences between the present invention and Queen et al., Stahlecker et al. and/or GB 2,205,116 or their combination, the attached figures 1 and 2

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show the steps of the several processes. Neither the Queen et al. or GB 2,205,116 processes, or their combination using the wrap spinning method of Stahlecker et al. will result in a first base fiber bundle that is wrap spun or ring spun with a second fiber comprising a binder material.

It is respectfully submitted that the combination of Queen et al. with Stahlecker et al. and GB 2,205,116 A fails to teach each and every limitation of claim 16, as amended, and that therefore a *prima facie* case of obviousness has not been established. It is earnestly requested that the rejection of claim 16 and claims 18, 22-24 dependent thereon, be withdrawn.

"To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." *In re Royka*, 490 F.2d 981, 180 USPQ 494, 496 (CCPA 1974)

"If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ 2d 1596 (Fed. Cir. 1988)

5. Claims 16, 18 and 21 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Lofquist (US 5,478,624) in view of Queen et al. (US 5,567,256), Scott (US 4,668,552) and Stahlecker et al. (US 4,495,758). Lofquist is relied upon as teaching a method of making synthetic blended yarns for carpets. Queen et al. is relied upon as disclosing a process of making blended yarns containing heat-activated adhesive and base fibers for carpets. Scott is relied upon as showing the desirability of uniformly spirally wrapping binder fibers around a core strand. Stahlecker et al. is relied upon as disclosing a blended wrapped yarn by wrap spinning a binder strand around a yarn sliver.

Claim 16 has been amended herein and claim 21 has been cancelled without prejudice.

Attached are Declarations under 37 C.F.R. §1.132 by Mr. Charles E. Bowers of Honeywell International Inc. and Prof. William Oxenham of North Carolina State University. As the Declarations present facts related to the fibers of Lofquist cited in the Office Action, it is respectfully submitted that they should be admitted.

Examiner has summarized the disclosure of the Lofquist method with emphasis on step b), i.e., blending the bulk base fiber with heat-activated binder fibers "via conventional means such as commingling to form a blended yarn..." However, the Examiner has

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admitted that Lofquist does not expressly teach using either a ring spinning or wrap spinning technique in forming the blended yarn. Key to the Examiner's reasoning in rejecting the instant invention is his finding that "blending by conventional means" includes processes such as ring spinning and wrap spinning. The basis for this finding is stated as follows: "Stahlecker et al. discloses a process of making blended yarns...." However, close examination of Stahlecker et al. fails to reveal the terms "blend", "blending", "blended" or other variant of "blend". Stahlecker et al. therefore provides no support to the proposition that wrap spinning is what a man of ordinary skill in the art would understand by the instruction in Lofquist to blend by conventional means.

Evidence of what the man of ordinary skill in the art understands by the statement "blending by conventional means" is submitted as follows:

- In the "Dictionary of Fiber & Textile Technology", Hoechst Celanese Corp., Charlotte, NC 1978, the term "blend" is defined as, "A yarn obtained when two or more staple fibers are combined in a textile process for producing spun yarns (e.g., at opening, carding or drawing). The term "blending" is defined as the combining of staple fibers of different physical characteristics to assure a uniform distribution throughout the yarn. (Copy attached)
- In "The Modern Textile and Apparel Dictionary", Fourth Revised Enlarged Edition, G.E. Linton, Ed., Textile Book Service, Plainfield, NJ 1973, the term "blend" is defined as, "A term used to describe a yarn obtained when two or more fibers are combined in the spinning process." The term "blending" is defined as "The combining of fibers of different colors such as heather-mixture, or of different types of fibers such as cotton or wool before spinning." (Copy attached)
- The Declaration of Prof. Oxenham states, "In my opinion, ring spinning or wrap spinning are not means of 'blending' as that term would be understood by one of ordinary skill in the textile arts."

The process of Scott (US 4,668,552) is illustrated in the attached Figure 3. The inventive process differs fundamentally from that of Scott as follows:

- The inventive process produces a tufting yarn suitable for insertion into a backing material in the manufacture of tufted carpeting. The process of Scott does not produce a tufting yarn. Scott entirely bypasses the production of a tufting yarn and a tufting

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operation but instead prepares a special yarn from a base fiber wrapped with a texturized binder fiber. This yarn is woven into a special fabric that is cut along a median plane to produce a carpet.

- The yarn in the inventive process is heated to melt the binder fiber thereby producing a tufting yarn with the binder in position around the base fibers providing radial constraint to the base fibers. In Scott, when the fabric is cut, so too is the binder fiber. When the fabric is heated, the binder fibers are free to shrink inward away from the face of the pile providing no radial constraint to the base fibers.
- The inventive process does not contain a texturizing step included by Scott. The wrap spun yarn produced by the inventive process has no counterpart in Scott.

It is seen that the process of Scott is incompatible with the present invention and incompatible with the processes of Lofquist and Queen. The man of ordinary skill in the art would not and could not combine Lofquist and/or Queen with Scott.

It will be readily appreciated that the problem of producing carpet yarns that have excellent wear resistance, superior tuft definition, more uniform appearance, firmer carpet feel and greater resistance to shedding has been a problem of long standing. Earlier attempts at solving this problem such as Lofquist, Queen and Scott represented advances in the art but did not meet all of the needs satisfied by this invention.

The instant patent application discloses novel means of addressing the problem. Mr. Bowers' Declaration makes clear the reason why the inventive yarns indeed show superior performance in carpets compared to the prior art Lofquist yarns.

In view of the foregoing, it is respectfully submitted that there is no motivation to combine Lofquist (US 5,478,624) with selective aspects of Stahlecker et al. (US 4,495,758), Scott (US 4,668,552) and Queen et al. (US 5,567,256) other than with the impermissible use of hindsight. Moreover, this combination fails to teach all of the limitations of the present invention. It is respectfully submitted that a *prima facie* case of obviousness has not been established over claim 16, as amended.

It is earnestly requested that this rejection of claim 16 and to claims 18, and 22-24 dependent thereon be withdrawn.

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6. Claims 16, 18 and 21 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Stahlecker et al. (US 4,495,758), taken with Queen et al. (US 5,567,256), Lofquist (US 5,478,624), GB 2,205,116 and Scott (US 4,668,552). Stahlecker et al. is relied upon as disclosing a process of making blended wrapped yarns. GB 2,205,116, Queen et al. and Lofquist are relied upon as teaching blended yarns comprising heat activated binder fibers. Scott is relied upon as disclosing spirally wrapping a binder strand around a base strand. Scott, Lofquist and Queen et al. are relied upon as disclosing the steps of heating to melt the binder around the yarn and cooling to harden the binder.

Claim 16 has been amended herein and claim 21 has been cancelled without prejudice.

Close examination of the Stahlecker et al. patent fails to reveal the terms "blend", "blending", "blended" or other variant of "blend". Stahlecker et al. therefore provides no support to the proposition that wrap spinning is a method of making a blended yarn. The "Dictionary of Fiber & Textile Technology", Hoechst Celanese Corp., Charlotte, NC 1978, The Modern Textile and Apparel Dictionary", Fourth Revised Enlarged Edition, G.E. Linton, Ed., Textile Book Service, Plainfield, NJ 1973 and the Declaration of Prof. Oxenham discussed in paragraph 6 of this response is evidence to the contrary.

The differences between the present invention and the disclosures of Lofquist (US 5,478,624), Queen et al. (US 5,567,256), GB 2,205,116 A, and Scott (US 4,668,552) and their combination with Stahlecker et al. (US 4,495,758) have been discussed in the preceding paragraphs 5 and 6 and are illustrated in the attached Figures 1-3. The process of Scott is seen to be fundamentally incompatible with the present invention and with those of Lofquist, Queen, and GB 2,205,116A. It is respectfully submitted that that there is no motivation to combine Stahlecker et al. with selective elements of Queen et al., GB 2,205,116 A, and Scott other than with the impermissible use of hindsight. Moreover, this combination fails to teach all of the limitations of the present invention. It is earnestly requested that the rejection to claim 16 and to claims 18, 22-24 dependent thereon be withdrawn.

7. Claims 16, 18 and 21 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-of co-

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pending application No. 09/143,583. As none of the relevant claims of either application has yet been allowed, Applicant will defer proffering a terminal disclaimer in this case.

8. In light of the foregoing amendments and remarks, is it submitted that the claims now of record, i.e. claims 16, 18 and new claims 22-24, are allowable and should be passed to issue. Applicants respectfully request the same.

The Examiner is invited to call the undersigned attorney if there are any unresolved issues to discuss same.

Respectfully submitted,  
Charles Edward Bowers

By Virginia Szigeti (Andrews)  
Virginia Szigeti (Andrews)  
Applicants' Attorney  
Reg. No. 29,039

I hereby certify that this correspondence is being deposited with the United States Patent & Trademark Office via facsimile to Examiner Sam Chuan C. Yao, Group Art Unit 1762, at 703-305-7115 on August 14, 2003.

Virginia Szigeti (Andrews)  
Virginia Szigeti (Andrews)